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Non-LTE modeling and simulations for spectroscopic analysis of stainless-steel Z-pinch plasma[1] A. DASGUPTA, J.L. GIULIANI, J. DAVIS, J.W. THORNHILL, Naval Research Laboratory, R.W. CLARK, Berkeley Scholars Inc, C.A. COVERDALE, B. JONES, D.J. AMPLEFORD, Sandia National Laboratories, BERKELEY SCHOLARS INC COLLABORATION, SANDIA NATIONAL LABORATORIES COLLABORATION — We have developed a collisional-radiative spectroscopic model that combines the accuracy of detailed accounting for all important excited states coupling with the completeness of a highly averaged Rydberg state model. The model was used to investigate the implosion dynamics of nested Stainless-Steel (SS) wire arrays and generate K- and L-shell spectra using a 1-D non-LTE radiation hydrodynamics model self-consistently coupled to a transmission line description of the device. We compare our SS spectra with experimental data of shot Z581 and Z1860 on the Z and the refurbished Z accelerators respectively, at Sandia National Laboratories. The simulations self-consistently include the effects of radiation transport and line broadening. We include level-specific dielectronic recombination data in order to investigate the $Ly_{_g}$satellite lines that are useful for diagnosing line broadening in a Z-pinch plasma at stagnation.

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